EFFECT OF DIFFERENT TYPES OF CLASSROOM ORGANIZATION ON PUPIL ACHIEVEMENT

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BY

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DEDICATION

I dedicate this thesis to my husband

Isaac Harper, Sr.

I also dedicate this work to my children

Isaac Harper, Jr.

and

Grace N. Harper, II

G. N. H.

ACKNOWLEDGMENT

"Our chief want in life is somebody who shall make us what we can"-- Emerson. I feel as Emerson felt and, therefore, I realize that those persons responsible for one's motivation are invaluable to one's intellectual growth.

So it is at this time that I take time to show my appreciation for the diligent efforts of my advisors -- Mrs. M. H. Jellins and Dr. L. S. Gaines. They shall forever serve as motivation for me in whatever I strive to do.

G. N. H.

TABLE OF CONTENTS

TABLE OF CONTENTS--Continued

LIST OF TABLES

LIST OF TABLES--Continued

CHAPTER I

INTRODUCTION

Rationale

Our nation is facing a serious fact. It may not survive as we know it. Problems of survival which may be classified under six broad headings are reflected in problems in education. The problems which have arisen and which threaten our survival have been aggravated by an expansion of population, a bust of technology, the discovery of new forms of energy, an extension of knowledge, a rise of new nations, and a worldwide rivalry of ideologies.

These problems will not yield to the specialists, who play major parts in our schools today. They must yield to specialists plus leaders of tomorrow who must be able to relate the past to the future, and the specific to the general. Tomorrow's problems may be solved by physicists who share with the world the responsibility of charting the disarmament of all nations. They may be solved by business men who function in the government of undeveloped countries. They may be solved by teachers who knock down the barriers of ignorance and misunderstandings between nations. Events in our classrooms today will prompt world events tomorrow.

The practical question is: Are the schools ready for the job? There are considerable reasons to say that they are not. One reason

for doubt is in history. American school methods and facilities have evolved from what society considered best at a given moment. They have been molded by other cultures, customs, regulations, and even by law. Today, acceptable ideas of school scheduling, sizes of classes, teacher loads and responsibilities, instructional materials, and architecture have become hardened. These practices have not been changed basically for generations, and their inflexibility makes it difficult to alter them now. Improvement in American education has been refinement; each improvement has had its effect, but all have been limited by existing framework of the schools.

A second reason for doubt arises from a limited interpretation of the concept of universal education. We have given it a single flat dimension that every boy and girl has an equal right to spend a certain number of years under a school roof. This concept today is in need of re-examination. There are at least two other dimensions in the idea of universal education: the maximum attainment of each student's talents, no matter how unequal that maximum may be; the development of each student's ability to function independently, and to understand education as a process that continues long after school years have been completed.

Changes are especially urgent because schools must provide education for increased numbers of persons, for longer spans of productive life, and at higher levels of understanding, competence, and skills to strengthen our democratic way of life. The task calls for a re-examination of school function and needs. Facing both change and the rapidity of change, education today is committed to a parti-

cular reaction, a tomorrow's approach to education today. The response to a changing school program becomes then the task of implementing opportunities for engagement. Decisions about time, space, material resources and human resources are immediate. Innovation is inevitable also at the classroom level where structuring and restructuring is necessary to make opportunities for engagement available to learners.

The mechanics of professional involvement for the educator are essential to program development. Administration in the school touches every phase in the school's program. Reaching every phase, in this manner, could be viewed by some as more autonomy in the school organization. When moving into a new arrangement, there are four areas of strategy at the disposal of the administrator in reaching desired outcomes. Open communication, when adequate, is the vehivle that unites the group for action. Achieving wholesome human relationships with the staff is another moving force. Decision making, in the process, exercises vested authority to effectively designate assisting responsibilities. Collective action is contingent upon the latter three areas.

If external pressure regarding "what to teach" is to be eased; and if the securities of the staff are to be protected and nutured; the tasks of the administrator must be able, but reflective in the goal seeking process.

Some decisions which have been made in terms of space and the use of materials may be seen in the design of school buildings for team teaching. Such designs provide for flexibility in the utilization of space and equipment. For example, the cafetoriums are

set up with tables and chairs already in place for eating and also for professional meetings.

Team teaching provides flexibility in scheduling. The most popular is the 15 minute module. Pupils may meet in the language laboratory or lecture hall for 30 minutes, in English for 45 minutes, in gym for 60 minutes, or in laboratory for 70 or 90 minutes.

Team teaching provides time for planning. It provides time for the teacher to develop techniques and material for large group instruction, to develop audio-visual aids, and to prepare presentations.

Restructuring which has provided for most of human resources is exemplified in the provision of salaried aids, clerical and instructional, which will provide for optimal use of teacher talent. Such an organization as team teaching, then, provides time for teacher planning, teacher-pupil planning, developing techniques, teacher preparation, and presentation.

The self-contained classroom organization provides only for small groups; one teacher to an average of 30 pupils. The class works independently of other classrooms, except possibly for a few common activities that are sponsored by the school, such as music groups, school assemblies, programs for parents, and similar endeavors.

Questions may be raised as to the nature of the learning which takes place in these very different organizational patterns. Is it that a more effective integration of learnings is brought to bear in situations where resources are utilized differently? Will some of the advantages claimed for attempts at restructuring the organizational complex of the school prove to be as effective as some

more traditional treatment? Test scores and conventional means of measuring achievement of objectives may or may not reveal ultimate changes hoped for but perhaps a change in profile of certain measures could reveal some progress toward these objectives.

Evolution of the Problem

The writer's interest in this problem grew out of her curriculum planning class, and the construction of the new Grove Park Elementary School building. In her research for the curriculum planning class at Atlanta University, she found that since 1957, much information has been written about team teaching. During this same period, several schools were being constructed in Atlanta, Georgia which were specifically designed for a team teaching pattern of school organization. The writer was scheduled to teach in one of these schools. Naturally there was concern for the advantages and disadvantages of team teaching procedures in terms of the pupils population with which the investigator was familiar. Such concern formed the basic upon which this research study was planned and executed.

Contribution to Educational Research

It is hoped that this study will focus attention on the need for continuous evaluation and revision of concepts of educational organization and methods in teaching.

Statement of the Problem

The problem for which this study was designed was to investigate the question of whether tested achievement in language, spelling, and arithmetic reasoning correlate more closely with achievement in reading

when teaching is done in a self-contained classroom than when instruction proceeds under a team teaching pattern of classroom organization.

Purpose of the Study

The main purpose of the study was to determine the existence of any significant relationships which skill in reading may have to other content areas when pupils are organized for learning activities under a one-teacher, self-contained classroom plan, on the one hand, and a team teaching plan on the other.

More specifically, the following questions were asked:

1. Are the relationships between achievement scores in reading and language significant ones, both when pupils are taught in a self-contained classroom and when they are taught by an instructional team?
2. Are the relationships between achievement scores in reading and spelling significant ones, both when pupils are taught in a self-contained classroom and when they are taught by an instructional team?
3. Are the relationships between achievement scores in reading and arithmetic problem solving significant ones, both, when pupils are taught in a self-contained classroom and when they are taught by an instructional team?

Scope and Limitations of the Study

This study was limited to 100 randomly selected Metropolitan Achievement Battery Forms A, B, C, and D test scores of students enrolled at the Grove Park Elementary School, Atlanta, Georgia, on the fourth grade level during the school year 1965-1966 and 100 battery test scores of fourth grade pupils enrolled during the school year 1966-1967.

Definition of Terms

The following definitions shall be considered in this study:

1. Team Teaching - The organization of students into large groups so the materials that are to be presented can be handled more effectively and efficiently for all the students rather than in smaller groups, allowing teachers to work together in the planning of curriculum materials, places teachers on a professional basis for the contribution and exchange of ideas and techniques, distributes responsibilities, and has the individual child observed by several teachers.

2. Self-Contained Classroom Teaching - The pattern of staff assignment in both elementary and secondary schools of one teacher, one class. In the elementary school, the teacher usually remains with the same group throughout the entire school day, and for all formal instruction given the child.

Method of Research

This investigation employed a descriptive-survey method of research. Test scores from comparable forms of the Metropolitan Achievement Battery comprised the basic data for the survey. A

statistical treatment of the basic data included measures of central tendency, measures of variability and the Pearson Coefficient of correlation. The test of significance used was the Fisher's "t" at the .05 level of confidence. Significance of coefficients of correlation was determined through the use of statistical tables listing coefficients of correlations significant at the .05 and .01 level of confidence at varying degrees of freedom, adopted from Wallace and Snedecor.[1] Differences in significant correlations were determined by noting differences of verbal descriptions of such correlations as negligible, low, moderate, high or very high.

Procedural Steps

The following procedural steps were employed in this study:

1. A careful review of related literature was made.
2. One hundred test scores were randomly selected from the Metropolitan Achievement Battery administered in the fall and spring of the 1965-66 school year. These were the scores of children who had been taught in the self-contained organizational setting. During the following year, 1966-67, these same children were taught in a team teaching organizational setting. The achievement scores from comparable forms of the Metropolitan Achievement Battery were recorded for the

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[1] J. P. Guilford, Fundamental Statistics in Psychology and Education, (New York: McGraw-Hill Book Co., Inc., 1950), pp. 609-10.

same one hundred children for the 1966-67 school term. The mean scores for the group were computed for performances in reading, language, spelling, and arithmetic for fall and spring testings in order to determine any differences in achievement in these areas for the two years where the organizational plans had differed. Of primary interest, however, was the particular relationships between growth in reading and growth in each of the content areas listed. To make this determination, scattergrams were constructed, and the Pearson coefficients of correlation was computed. A table of significants of correlation for varying degrees of freedom was consulted to determine significance of coefficients of correlation computed at the .05 level of confidence.

3. These data were interpreted in terms of the statistical treatment of the data. Conclusions, implications, and recommendations were made as warranted by the findings of the study.

Locale of Study and Description of Subjects

The one hundred subjects in this research are both male and female ranging in ages from ten through twelve. The subjects came from lower middle class homes of Negro parents who are unskilled and semi-skilled laborers.

This study was conducted during 1967-68 using data drawn from permanent records of pupils enrolled at the Grove Park Elementary School, Atlanta, Georgia, for the years 1965-66 and 1966-67.

The pupils were grouped in order to provide individually planned programs for leraners, taking into account the specific objectives to be achieved, promoting flexibility in assigning pupils for instructional grouping. The school provided an opportunity for each student to progress according to his ability.

Description of Instruments

The instruments used in this research were the Metropolitan Achievement Battery Forms A, B, C, and D. This battery affords dependable data concerning the level of pupils' achievement in the important skill and content areas in the curriculum. It is designed to yield this information economically, efficiently and objectively. The series attempts to measure those outcomes of instruction which, according to authoritative judgment and consensus of current practice, are the important goals of present elementary instruction.

Survey of Related Literature

Literature pertinent to this study was reviewed in terms of the following areas of concern:

1. Team Instruction in Elementary and Secondary Schools
2. The Self-Contained Classroom
3. The Effectiveness of Various Organizational Plans.

The Use of Team Instruction in Elementary and Secondary Schools

Many curriculum problems, particularly those in which the building of a unified educational program is effective, are best attacked by a team combination of backgrounds and skills. Some

training is often needed to insure efficient operation, but the results will repay the extra efforts.[1]

Today Americans are trying to respond creatively to changing needs and circumstances. One of the newest stars on the educational horizon has been the revised team teaching concept. Since 1957, America has witnessed a kind of "team teaching" explosion. Hundreds of schools have been experimenting with variations of team teaching, but regardless of the variations, it is still essentially a way of organizing the staff, the instructional program, the school area, and equipment.

Team teaching is more of an organizational idea than a set of procedures and practices. Teams differ in many ways and no two teams are likely to work in the same way. It is this flexibility which lends itself to the school's needs.

In general, certain basic elements are present in team teaching programs. These are: (1) Teams which are composed of a given group of students generally ranging from 100 to 150 in number, (2) a group of four to six teachers, and (3) resources both within the school (interns, teachers aids, counselors, librarians, etc.), and outside it.

The team usually consists of a faculty team which assumes responsibility for a substantial portion of the academic program of the team. Each team usually has a leader, a faculty member who

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[1] Harold J. McNally, Improving the Quality of Public Schools Program (New York: Columbia University, 1960), p. 49.

coordinates the team's efforts. The clerical and routine duties are performed by non-certified teacher aids, thus freeing the teachers of the team for planning, organizing, evaluating, and counseling. Each team may develop a roster of citizens or community resources upon which to draw in order to enrich the program.

In the team teaching program, many staffs have instituted studies, using teacher assistants in the search for more time for professional teachers. They were community resources of people with special experience, such as clerks, bus drivers, high school teachers, college teachers, and graduate students.

For example, at Richwood, West Virginia High School, the teacher assistant idea solved a specific problem. A qualified business education teacher found little time to teach in his field because so many hours were given to driving education. A team approach worked out by Richwood administrators assigned the teacher classroom instruction and the school bus driver to behind-the-wheel training. A control class was established in the high school of a control nearby community.

Objective tests at both schools indicated that the experimental group gained over the control group in skills; that there was no difference in gain over the control group in knowledge; but that the control group achieved better driver attitudes than did the experimental group.

The following year, other small schools in the state joined in the project. Specific attention was given to check the effect of

team instruction on student-driver attitudes.[1]

After the experiment, the State of West Virginia established criteria for selecting school bus drivers who could also assist teachers in driver-education.

Tests the second year demonstrated that school bus drivers can serve on the driver-education team without lowering the quality of instruction, and that students do as well in every respect as students taught by customary methods.

At the end of two years, answers to questionnaires by teachers and teacher aids reported these findings pertinent to the team teaching project:

1. Team teaching provides the setting in which individual teachers can best use and further develop their individual talents.

2. Students can, and do, benefit from the best the teachers have to offer.

3. Teachers can, and do, learn to use teacher assistants effectively and efficiently for non-professional tasks.

As in elementary schools, team teaching has been introduced into high school, as pilot projects in specified subject areas. All subjects are team taught, and in some cases, teams are formed across subject lines.

Five teachers in Brecksville, Ohio developed an energetic team within an otherwise traditional program. Previously, they taught 550 students in 28 sections of tenth grade World History, eleventh grade American History, and twelfth grade American Govern-

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[1]Lloyd J. Trump and Dorsey Baynhan, Guide to Better Schools (Chicago: Rand McNally and Company, 1961), p. 81.

ment. Each teacher taught his subject as often as five times per day.

By rescheduling and pooling their talents, they now teach approximately 125 students per period. No subject is offered more than twice a day. Students meet in the lecture hall for large-group presentations two or three times per week. One day each week is reserved for small-group discussion in groups of 15 or fewer students. The remaining time is spent on independent study in the library.

Instructors use the overhead project and a series of well prepared transparencies to illustrate each lecture. Presentations are taped or mimeographed and are made available for absentees or for review.

According to the principal of Brecksville High School, the enthusiasm generated by the teachers ..."rubs off on the students so much so that parents tell us that their children are discussing history at the dinner table."

The teachers too, were enthusiastic about what they were doing. They said: "The team teaching approach allowed us to develop subjects in depth." One team member maintained he had never put as much time into preparation before entering the team. He stated: "Let's face it, when you get in front of 125 students and some colleagues, you had better be prepared." Another teacher, new to the profession, said, "It's marvelous! I had an opportunity to work with four experienced teachers, and their help has been invaluable." This attitude is universal.[1]

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[1]Harold S. Davis, How to Organize an Effective Team Teaching Program (Englewood Cliffs: Prentice-Hall, Inc., 1966), pp. 31-32.

Clerical aids or secretaries

These aids are assigned clerical and routine tasks that are but aspect of the role of the teacher aide. Assignments given clerical aids vary considerable from school to school, but the duties may include such chores as these:

1. Keeping attendance records.
2. Preparing report cards.
3. Collecting milk money, lunch money, and bank money.
4. Entering information (other than marks and teacher's moments) on cumulative reports.
5. Checking class lists and revising as necessary.
6. Inventoring books and supplies and requisitioning supplies.
7. Keeping files on children's work (material selected by teachers).
8. Preparing and running off duplicator materials.
9. Making charts planned by teachers.
10. Securing pictures, books, art supplies, and other materials for lessons, taught by the teachers.

When selecting teacher aids, certain items are requisites for all candidates. The following listings were compiled from a study of the requirements of various schools using teacher aides:

1. Good moral character.
2. Evidence of good physical and mental health.
3. Good grooming.
4. Good English usage.
5. Pleasing personality.
6. Average intelligence.
7. Successful experience.

8. Some formal education beyond high school for most positions.

9. Liking for children and youth.

10. Ability for work under the supervision of the classroom teacher -- "supervision tolerance."[1]

Large-group instruction

In the independent study program at Brookhurst Junior High School, Anaheim, California, any class that contains more than 15 students provides a large group.

Basically, large-group instruction is teacher-dominated. Although the learner is physically passive except for taking notes, he is very active mentally as he reacts to what he has seen and heard, and as he notes the matter he wishes to discuss further with his colleagues or to study in an appropriate setting.

Just how effective large-group instruction is depends on two factors: preparation and presentation.

To make a large-group presentation effective, teachers must:

1. Assess the student's past achievements and interest in the topic.

2. Divide the groups on the basis on their prior knowledge of the subject to be discussed.

3. Relate new material to what is already known.

4. Encourage students to signal at any failure to grasp new ideas.

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[1] Ibid.

5. Try to keep explanations simple.

6. Use clever illustrations.

7. Develop meaningful relationships.

8. Use questions that may be answered by group response.

Obviously, through preparation for a large-group presentation requires careful study and creativity, as well as consideration time and energy. In fact, a competent, experienced teacher might easily spend 10-15 hours preparing a single preparation to be given for the first time.[1]

The Wisconsin Improvement Program, which involved a number of school districts in the state, showed that team teaching, provided it meets the following criteria, offers a greater opportunity for achieving the objectives of elementary school education in a modern, complex, and interdependent society than any other organizational plan:

1. The first criterion of team teaching in the elementary school is that it involves a distinct group of teachers who assume joint and simultaneous responsibility for planning, executing, and evaluating an educational program for a distinct group of pupils.

2. The second criterion is that considerable time be allotted for cooperative planning.

3. The third criterion is that members vary in their competencies and interests and that the team capitalize on these individual differences.

4. The fourth criterion points out the necessity of differentiation of responsibility.

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[1] Gardner Swenson, Providing for Flexibility in Scheduling and Instruction (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966), p. 47.

5. The final criterion, and most obvious, for elementary school team teaching is that the size and composition of any learning group should fit the nature of the activity and the objectives sought.

The foregoing criteria are general and permit a great deal of latitude both for these practicing team teaching and those considering practicing team teaching.[1]

The self-contained classroom

The traditional pattern of staff assignment in both elementary and secondary schools has been one teacher, one class. In the elementary school, this meant that a teacher was assigned a class group for instructional purposes, usually remaining with that group throughout the entire school day, and for all formal instruction to be given it. This is known as a self-contained classroom. The class, generally speaking, worked independently of other classrooms, except possibly for a few common activities that might be sponsored by the school, such as a music group, school assemblies, programs for parents, and similar minor endeavors. However, a number of schools over the years experimented with other arrangements, usually modest abridgments of the self-contained classroom plan.

In more recent years, demands have been voiced by both educators and parents for modifications of the fully self-contained type of organization, so that at least some of the instructional responsibilities for the class would be shared with specialists in particular areas of

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[1] David W. Darling, "Team Teaching," NEA Journal, Vol. LIV (May, 1965), pp. 24-25.

study. Usually the first break in the self-contained plan was the assignment of specialized teachers in physical education, music, and/or art to the elementary school staff. These staff members were the responsibility of either teaching their specialty with each appropriate class group or supervising and assisting the teacher in directing that aspect of the curriculum.[1]

The effectiveness of various organizational plans on school achievement

One main focus in surveying the related literature was upon various means of organization and their relative effort on the achievement of boys and girls at various levels in the elementary and high schools. D. W. Holmes completed a study where the departmental and non-departmental plans of organization were concerned. The major purpose of this study was to determine differences in achievement in school studies of two groups of children who had been taught under the two plans of organization. Sixty seventh grade children were used, thirty children taught in a departmental situation and thirty taught under a non-departmentalizational plan. The investigator indicated that the means of organization for instruction yielded no significant differences in the achievement of Social Studies information among the subjects used. This investigator further stated that departmental and non-departmental plans of organization were not significant when a comparison is made of their advantages and disadvantages with the

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[1]William M. Alexander and J. Galen Saylor, Curriculum Planning for Modern Schools (New York: Holt, Rinehart and Winston, Inc., 1966), p. 359.

group under study in teaching Social Studies.[1]

The opinion of teachers concerning the relative effectiveness of two systems of organization were analyzed by Bowden. Generally, between the graded and non-graded plans of organization, a large percentage of the teachers participating in the study appeared to believe that methods and technique used in both situations are essentially the same. In the non-graded organization the learning situations followed a less rigid time schedule thereby making possible desirable adjustments for individual pupils. The investigator proposed that these provisions could promote maximum academic, social, and emotional growth. In this as in other plans of organization, it was the opinion of these teachers that the teacher plays a most important role in that the success of the program depends upon the understanding and acceptance of such systems of organization by teachers involved in the program.[2]

Team teaching is characterized by a combination of large group and small group instruction. Some of the research literature has reported findings which indicate the effectiveness of various types of interclass groupings. Gibbs, for example, was primarily concerned with large and small groups instruction in the instruction of Science to

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[1] D. W. Holmes, "Comparison of Departmental and Non-Departmental Plans of Organization for Teaching Social Studies to Two Seventh Grade Classes." (Unpublished Master's thesis, Atlanta University, 1963), p. 45.

[2] Mary A. Bowden, "Teacher's Opinions and Attitudes Toward Non-Grades Procedures and Practices in Elementary Schools." (Unpublished Master's thesis, Atlanta University, 1962), pp. 51-52.

ninth grade learners. With the large, single group, instruction was conducted by means of recitation based on prior assignments. The small groups were organized on the bases of interest, levels of achievement, or differentiation of task to be completed. Findings from this investigation seemed to have warranted the conclusions that learners experiencing single or whole group instruction and those experiencing small group instruction resulted in similar or equal accomplishments in reading and arithmetic as well as in science. Gibbs further concluded that both whole group instruction has a function and that pupils may achieve as much in one situation as in another.[1]

Non-graded elementary plans

The significant aim in the creation of a non-graded educational program is one that is responsive to individuals and to which individuals are responsive. One good example of the non-graded plan is the Mark Hopkins plan.

The Mark Hopkins School, located in Elk Grove Village, Illinois, has a student enrollment of 268 children. The school is especially designed to implement the organizational plan described. (However, this plan has operated for several years in the Rupley School in Elk Grove Village, a building of conventional school architecture.)

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[1] Jessie A. Gibbs, "The Differentiated Science Achievement Through "Group" and "Traditional" Methods for Ninth Graders in the Sol C. Johnson Laboratory School, Savannah, Georgia, 1958-59." (Unpublished Master's thesis, Atlanta University, 1959), pp. 65-66.

The Mark Hopkins plan has these essential features:

1. It is ungraded so that every child will have an opportunity to grow and develop academically at his own rate of learning.

2. The school has developed a learning center to provide a physical environment of space and appropriate materials that will enrich and extend the teachings in the basic skills.

3. The curriculum is based upon team teaching. Teachers working together can better offer small group instruction in the basic subjects -- reading, math, language arts, as well as teaching social studies and science to larger heterogeneous groups where the child may, in turn, be sub-divided into groups working on specific projects.

The teacher in the study center tests all children to diagnose their specific problems, she then makes recommendations to classroom teachers when group instruction would be more helpful and expedient. In individual cases, she helps the reading and math teachers meet pupil's learning needs she has identified.[1]

Glass summarized that all schools are organized for a reason. Often organizational plans are formulated in attempts to minimize effects of inadequate physical and human resources. A more recent development in our efforts to more effectively organize our schools and thereby provide a more adequate learning situation is Team-Teaching. In such a plan, two or more teachers are given responsibility, working together, for all or a significant part of the instruction of the same group of students. Hence, any studies on

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[1] Bryce Perkins, Getting Better Results from Substitutes, Teacher Aides, and Volunteers (Englewood Cliff, New Jersey: Prentice-Hall, Inc., 1966), pp. 37-45.

comparison between effectiveness of the traditional plan and the team-teaching plan would represent a contribution to instructional procedures.[1] In her study Glass found no significant differences in the achievement of pupils taught in the self-contained classroom and under a team-teaching plan of organization.

Some implications from the Glass study point up the necessity for the continuous evaluation of changing organizational plans. She states: Serious research programs involving more students should be conducted by schools to gain additional standards of measurements for determining whether the learning goals are being reached, particularly with regard to team-teaching as an instructional tool. For team-teaching to be as effective as it might be, there should be concern for the total implications of the program: not just having two or more teachers, but selection of pupils, curriculum, and teacher training must be taken into consideration. There is an outstanding and urgent need for testing these pupils regularly in all areas of development as to determine the cause for educational retardation which they are experiencing.[2]

Summary of related literature

In the self-contained classroom, the school day is composed of many different periods as there are different subjects, usually without

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[1]Katherine Tibbs Glass, "Test Differences in Achievement, Personality, Parental Opinion and Teacher Attitudes Between Self-Contained and Team Teaching Taught Pupils." (Unpublished Master's thesis, Atlanta University, 1965), p. 133.

[2]Glass, loc. cit., p. 146.

too much regard for whether each succeeding subject in the day is related to its predecessor or its successor. In the elementary school, this meant that the teacher usually remained with the same group throughout the day. However, a number of school systems over the years experimented with many kinds of self-contained classrooms.

In more recent years, public opinion has demanded modifications of the old self-contained classroom methods. Out of this, came the specialists in particular areas of study, such as physical education, music, and art. The specialist usually spent part time at a given school, but traveled to several schools to teach full time. From the specialists' program came the team teaching ideas.

It has been found by many public school systems that pupils learn faster where adequate planning, organizing, scheduling, school and community participation, and teachers and teacher aides working together as a team.

The teacher will receive more professional and personal stimulation working on a team than working in isolation. There will be better communication among staff members, more motivation for continuous curriculum improvement, more cooperative planning, and better self preparation.

Communication within teams and between teams has yet to be perfected, but the instructional responsibilities of the members of a team vary in accordance with staff function, professional specialization and competency, and personal interest and desire.

The challenges of the nuclear age place emphasis on change, and with this change will come the instructional revolution. We need this if it will help us to make more efficient use of teachers' time

and skills.

Team teaching promises to ease the teachers' shortage, give superior teachers an opportunity to assume superior responsibilities, improve salaries for teachers, free teachers from burdensome duties, and provide better educational opportunities for our children.

CHAPTER II

ANALYSIS AND INTERPRETATION OF DATA

Introductory and Background Data

This chapter will present, analyze, and interpret the data pertinent to determining any relationship which skill in reading may have two other content areas when pupils are organized for learning activities under a one-teacher, self-contained classroom plan on the one hand, and a team teaching plan on the other. Specifically, this study proposed to ask the following questions:

1. Are the relationships between achievement scores in reading and language significant ones, both when pupils are taught in a self-contained classroom and when they are taught by an instructional team?
2. Are the relationships between achievement scores in reading and spelling significant ones, both when pupils are taught in a self-contained classroom and when they are taught by an instructional team?
3. Are the relationships between achievement scores in reading and arithmetic problem solving significant ones, both, when pupils are taught in a self-contained classroom and when they are taught by an instructional team?

The test results used were from the administration of the Metropolitan Achievement Battery Forms A, B, C, and D to 100 fourth grade pupils selected at random from fourth grade sections in 1965-66 and scores made by the same pupils when in fifth grade during 1966-1967.

The two hundred test scores selected for the one hundred subjects were those of both male and female children ranging in ages from 10 through 12.

In the fourth grade subjects used were pupils taught by one teacher in a self-contained classroom with assistance in Physical Education, Music, and Art. There was an average of 30 pupils per teacher.

In the fifth grade the subjects were taught in a team teaching organization in which they experienced training in groups ranging from 100 to 150 in number, together with a group of from four to six teachers, with the use of trained aids, counselors, librarians, and interested parents. The team had a faculty leader who coordinated the team's efforts. The clerical and routine duties were not performed by the teachers, but were performed by the teacher's aids, thus freeing teachers for planning, organizing, evaluating, counseling, and professional meetings. Team teaching provided the setting in which individual teachers could best use their individual talents in developing effective instructional programs. The data were organized around four areas of study, consisting of reading, language, spelling, and arithmetic, where performances were determined and the linear associations computed between reading and language, reading and spelling, and reading and arithmetic. The linear relationship was determined through the use of the Pearson's product-moment coefficient. The significance of the correlations were determined

through the use of a table of coefficients of correlation and ratios significant adapted from Wallace and Snedecor's Correlations and Machine Calculation.[1]

This chapter will be presented in sections dealing with reading, then with comparisons and relationships of reading achievement levels and levels of achievement in the content areas under consideration. Within these sections the comparisons will deal with mean performances of children who were taught in a conventional self-contained classroom and mean performances of children who were taught by an instructional team. The major topical headings will be: (1) Reading achievement under two types of classroom organization, (2) Reading and language achievement of pupils in self-contained and team-teaching instructional settings, (3) Reading and spelling achievement of pupils taught in self-contained and team-teaching instructional settings, and (4) Achievement in reading and arithmetic reasoning of pupils taught in self-contained and team-teaching instructional settings.

Reading Achievement Under Two Types of Classroom Organization

This study was designed to measure relative performances in reading and content areas by one group of learners taught in different classroom settings. It is, however, as important to present initially, evidence which will serve two purposes: (1) to establish the fact that growth

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[1] J. P. Guilford, Fundamentals Statistics in Psychology and Education (New York: McGraw-Hill Book Company, 1965), p. 580.

occurred in both settings and on two grade levels, and (2) to re-emphasize the fact that this study does not question the differences in, or extent of growth among these learners. Of importance is the comparative development of the pupils in certain defined aspects of the total growth profile insofar as reading and content areas are concerned. Each comparison is conceivable because differing situations and conditions have been known to act as determinants of the nature of the product.

An overview of the comparison in performance gains shows that there were few significant differences in extent of gain for the two groups studied. Both groups showed less than average performances when compared with national norms for their respective grades in September and May testings, but May results show mean performances nearer expected norms for grade. A detailed presentation of the test results in each area follows:

Reading achievement gains of subjects taught in a self-contained classroom

The data resulting from an administration of the reading section of the Megropolitan Achievement Test to 100 fourth grade pupils who had been taught in a self-contained classroom are presented in Table 1. In September, 1965, the scores in reading ranged from a low grade equivalent of 3.1 to a high of 4.0, with a mean of 3.614, a standard deviation of 1.671, and a standard error of .168. In May, 1966, the low was a grade equivalent of 3.3, the high was 4.6, with a mean of 4.103, a standard deviation of 2.593, and a standard error of .261.

It may be noted that the difference between the mean reading performances at the beginning and at the end of the school year was .489; the "t" was 1.583 and was not significant at the .05 level of confidence.

TABLE 1

GROWTH IN READING ACHIEVEMENT LEVELS OF FOURTH GRADE PUPILS TAUGHT FOR ONE YEAR IN A SELF-CONTAINED CLASSROOM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1965	100	3.1-4.0	3.6	1.67	.168	.489	1.583
May, 1966	100	3.3-4.6	4.1	2.59	.261		

This finding suggests that the reading levels of the fourth grade pupils, whose scores were used for the study, did not change substantially after one year of instruction in a self-contained classroom.

Reading achievement gains of pupils taught by an instructional team

During the school year, 1966-67, the pupils whose scores were used to describe growth in reading after a year in a fourth grade, self-contained classroom, were assigned to an instructional team for a fifth year of elementary study. The pupils were again tested in September and May of their fifth year in school, ostensibly to evaluate to general effectiveness of the change in the organizational plan for instruction. Those scores were utilized for this investigation. The data resulting from the administration of the Metropolitan Achievement Test to 100 pupils who had been taught under a team teaching plan of organization are presented in Table 2.

The scores in reading ranged from a low grade equivalent of 3.7, to a high of 5.2, with a mean of 4.340, a standard deviation of 4.150, a standard error of .417, for September, 1966. In May, 1967, the grade equivalent low was 4.7, and the high was 6.4, with a mean score of 5.60, a standard deviation of 8.00, and a standard error of .805.

Although the "t" shown in Table 2, 1.389, was not significant at the .05 level of confidence, an inspection of the data shows that this group of pupils achieved a gain of 1 year and approximately 2 months in their reading levels. This gain represents an improvement over the achievement increase of approximately five months at the grade four level under a self-contained plan of classroom organization. This finding suggests that there were factors operative at the fifth grade level,

and under a team-teaching plan, which resulted in more rapid growth of the pupils. The investigator acknowledges the fact that maturational factors would account for the difference in rate of growth to some extent. However, there has been some evidence that deficient performances in school tend to become more serious unless some specific steps are taken to alleviate problems causing the deficiencies. On this basis, the conclusion may be drawn that to some extent, the change in organization for instruction could have exerted some influence on the improved performances of the pupils in reading.

Reading and Language Achievement of Pupils in Self-contained and Team-teaching Instructional Settings

The concern of this phase of the investigation was focused primarily upon the relative achievement of pupils in reading and in language taught where there existed two plans of organization for instruction. The data were collected from the language and reading components of the Metropolitan Achievement Battery. It was expected that wherever there occurred an increase in the amount of achievement gain in reading, that there would also occur a corresponding increase in proficiency in over-all language skills. In order to test the relationship, Pearson's product-moment coefficient of correlation was computed for reading and language scores from the tests given in May to the "self-contained" group and again from scores of the group taught by the instructional team. With one exception, the distributions of these sets of data were essentially normal. Pertinent data regarding the measures of central tendency and dispersion are presented in Table 3.

TABLE 2

GROWTH IN READING ACHIEVEMENT OF FIFTH GRADE PUPILS TAUGHT FOR ONE YEAR BY AN INSTRUCTIONAL TEAM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1966	100	3.7-5.2	4.34	4.15	.417	1.260	1.389
May, 1966	100	4.7-6.4	5.60	8.00	.805		

TABLE 3

MEASURES OF CENTRAL TENDENCY AND VARIATION OF READING AND LANGUAGE SCORES USED IN DETERMINING RELATIONSHIPS BETWEEN READING AND LANGUAGE ACHIEVEMENT

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of Mean	Percent of Scores Below Mean	Percent of Scores Above Mean
Reading, Self-contained Group	100	3.3-4.6	4.10	2.59	.261	20	41
Language, Self-contained Group	100	3.7-4.6	4.17	4.25	.428	32	35
Reading, Team Instruction Group	100	4.7-6.4	5.60	8.00	.805	34	46
Language, Team Instruction Group	100	4.1-6.4	5.22	8.92	.897	37	40

In May, 1966 the scores in reading for the self-contained group ranged from a low grade equivalent of 3.3, to a high of 4.6, with a mean of 4.103, a standard deviation of 2.593, and a standard error of .261. Forty-one or 41% scored above the mean. In May, 1967, the low for the team-instruction group was 4.7, and the high was 6.4, with a standard deviation of 8.008, a mean of 5.60, and a standard error of .805. Thirty-four or 34% of the pupils scored below the mean and 46 or 46% scored above the mean.

The scores in language for the self-contained group ranged from a low grade equivalent of 3.7 to a high of 4.6, with a mean of 4.176, a standard deviation of 4.259, and a standard error of .428 in May, 1966. Thirty-two or 32% of the pupils scored below the norm, and 35 or 35% scored above the mean. In May, 1967, for the team-instruction group the low grade equivalent was 4.1 and the high was 6.4, with a mean of 5.22, a standard deviation of 8.923, and a standard error of .897. Forty or 40% of the pupils scored below the mean and 37 or 37% scored above the mean.

Language achievement gains of pupils taught in a self-contained classroom

The data resulting from an administration of the language component of The Metropolitan Achievement Battery to pupils taught in a self-contained classroom are presented in Table 4.

For the group taught in a self-contained classroom, scores in language ranged, in September, 1965, from a low grade equivalent of 3.3 to a high of 4.0, with a mean score of 3.655, a standard of 1.765, and a standard error of .77.

TABLE 4

GROWTH IN LANGUAGE ACHIEVEMENT OF PUPILS TAUGHT IN A SELF-CONTAINED CLASSROOM

	Number	Range of Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1965	100	3.3-4.0	3.65	1.76	.77	.521	.935
May, 1966	100	3.7-4.6	4.17	4.25	.428		

In May, 1966, this same group achieved a mean score of 4.17 with scores ranging from 3.7 to 4.6. The standard deviation was 4.259, with a standard error of .428. Since grade scores are read in terms of years and months in school, it may be noted that the mean of three years and six months in September, 1965, increased to a mean achievement level of one month in the fourth grade in May, 1966. The difference between the means represents an increase of approximately five months growth in language over an entire school year in the self-contained classroom. This deficit in rate of growth is similar to that of reading under the same instructional plan. The "t" of .935 was not significant.

Language achievement gains of pupils taught by an instructional team

Data resulting from the administration of the language section of the Metropolitan Achievement Test to fifth grade pupils taught by an instructional team are presented in Table 5.

For the group taught by an instructional team, the scores on the language component of the achievement battery ranged from a low grade equivalent of 3.5 to a high of 5.2, with a mean of 4.282, a standard deviation of 3.766, and a standard error of .378 in September 1966. In May, 1967 the low was 4.1, and the high was 6.4, with a mean of 5.22, a standard deviation of 8.923, and a standard error of .897.

The data in Table 5 show further that the test for significance of difference yielded a "t" of .963. This ratio was not significant. An inspection of the increase in grade level achievement reveals nine months of growth in language during this year where the pupils were taught by an instructional team.

TABLE 5

GROWTH IN LANGUAGE ACHIEVEMENT OF PUPILS TAUGHT BY AN INSTRUCTIONAL TEAM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1966	100	3.5-5.2	4.282	3.76	.378	.938	.963
May, 1967	100	4.1-6.4	5.22	8.92	.897		

The mean achievement growth for pupils in the self-contained setting in language was only five months. With an acknowledgment of the influence of maturational and perhaps methodological factors, the data would appear to suggest that rates of achievement growth in language were higher under a team-teaching plan.

The ultimate purpose for this investigation was to determine whether there was growth in the language area which correlated significantly with growth in reading under the two plans of organization.

The relationship of growth in reading and language under two organizational plans

Table 6 presents data resulting from the computation of "r" for reading and language scores for pupils when taught under the two plans of organization.

TABLE 6

COEFFICIENTS OF CORRELATION FOR READING AND LANGUAGE UNDER TWO PLANS OF ORGANIZATION

Organizational Plan	"r"
Self-Contained May, 1966	.14
Team-Teaching May, 1967	-.32*

* Significant at .05 level of confidence

Table 6 shows a comparison of "r" computed for reading-language

under the self-contained plan of organization and "r" computed for reading-language in a team-teaching situation. The relationship between achievement in reading and language is a significant one under the team plan. As a negative index, the "r" of -.32 denotes that while scores in one area do increase, that there is a tendency for the scores in the second area to decrease. In the case of these data, reference to Table 3 on page 34 will show that while reading scores ranged from 4.7 to 6.4, the language scores showed a lower base score of 4.1 although the maximum scores were the same. A relationship has been established as significant, but it appears that under the team teaching plan, among the pupils with which the study is concerned, while reading achievement assumes an upward trend, the language achievement level remains static or decreases.

Reading and Spelling Achievement of Pupils Taught in Self-Contained and Team-Teaching Instructional Settings

The focus of this section of the report is upon the relative achievement in reading and in spelling who were taught under two different organizational patterns. The data were collected from the spelling and reading components of the Metropolitan Achievement Battery. In order to establish any relationship which may have existed, "r" was computed for spelling and reading scores from tests administered in May to both groups under study. It is to be noted, however, that although the number of scores is large, the distribution of these scores departs somewhat more than is desirable from normality. Under these conditions, the resultant "r" may be underestimated. Measures of central tendency and dispersion pertinent to this discussion are presented in Table 7.

TABLE 7

MEASURES OF CENTRAL TENDENCY AND VARIATION OF READING AND SPELLING SCORES

	Number	Range Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Percent of Scores Below the Mean	Percent of Scores Above the Mean
Reading, Self-Contained Group	100	3.3-4.6	4.10	2.59	.261	20	41
Spelling, Self-Contained Group	100	3.0-4.7	4.10	3.49	.351	18	44
Reading, Team-Instruction Group	100	4.7-6.4	5.60	8.00	.805	34	46
Spelling, Team-Instruction Group	100	3.8-6.5	5.13	6.9	.701	21	59

In May, 1966 the scores on spelling for the self-contained group ranged from a low grade equivalent of 3.0 to a high of 4.7, with a mean of 4.109, a standard deviation of 3.491, and a standard error of .351. Forty-four or 44% of the pupils scored above the mean, and 18 or 18% scored below the mean. In May, 1967, the lowest score for the team group was 3.8, and the high was 6.5, with a mean of 5.138, a standard deviation of 6.974, and a standard error of .701. Twenty-one or 21% of the pupils scored below the mean, 59 or 59% scored above the mean.

For the reading score distributions, the set of data presented with regard to the team group does approach normality. The distribution for the self-contained reading data follows a pattern similar to that of the spelling score distribution.

Achievement gains in spelling of pupils taught in a self-contained classroom

The data resulting from an administration of the spelling section of the Metropolitan Achievement Test to pupils who were taught in a self-contained classroom are presented in Table 8.

For pupils who were taught in a self-contained setting, the scores in spelling ranged from a low grade equivalent of 3.0 to a high of 3.9, with a mean of 3.601, a standard deviation of 1.563, and a standard error of .157 in September, 1965. In May, 1966, the low grade equivalent was 3.0 with a high of 4.7, a mean of 4.106, a standard deviation of 3.491, and a standard error of .315. The difference between the means was five months. The test for significance shows a "t" of 1.63, and was not significant at the .0r level of confidence.

TABLE 8

GROWTH IN SPELLING ACHIEVEMENT OF PUPILS TAUGHT IN A SELF-CONTAINED CLASSROOM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1965	100	3.0-3.9	3.60	1.56	.157	.505	1.63
May, 1966	100	3.0-4.7	4.1	3.49	.351		

These data show that for the pupils taught in the self-contained classroom, there was an increase in the mean spelling achievement level of approximately five months. It is generally expected that mean growth in achievement over an entire school year would accrue to nearer ten months. It appears, therefore, that the group of pupils under study evidenced a slower rate of growth in spelling than would be expected, but spelling achievement was slightly superior to that in reading during the same period. It may be noted on Table 3, page 34, that growth in reading only accrued to a little less than five months, and was not significant.

Achievement gains in spelling of pupils taught by an instructional team

The data resulting from an administration of the spelling component of the Metropolitan Achievement Test to pupils who were taught by an instructional team are presented in Table 9.

The data for pupils taught by an instructional team show that in September, 1966, spelling achievement scores ranged from a low of 3.4 to a high of 4.9, with a mean score of 4.172, a standard deviation of 4.152, and a standard error of .417. In May, 1967, the range of grade equivalent scores was a low of 3.9 to a high of 6.5. The mean achievement score was 5.13, with a standard deviation of 6.974 and a standard error of .701. The difference between these means was .966 which when tested for significance yielded a "t" of 1.185. The "t" was found to be insignificant at the .05 level of confidence.

TABLE 9

GROWTH IN SPELLING ACHIEVEMENT OF PUPILS TAUGHT BY AN INSTRUCTIONAL TEAM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1966	100	3.4-4.9	4.17	4.15	.417	.966	1.18
May, 1967	100	3.9-6.5	5.13	6.97	.701		

These data show that for the pupils taught by an instructional team, there was an increase in the mean spelling achievement level of approximately ten months, which represents about one grade level. Reference to Table 8, page 43 shows that for a similar period, pupils taught in a self-contained classroom achieved a mean of only five months. It appears that for the group when taught by an instructional team achieved at twice the rate as when taught in the self-contained classroom by one teacher. When the spelling achievement of the team group is compared with their reading achievement for the same period, as shown in Table 3, page 34, that achievement in reading was slightly superior to that in spelling, although both mean gains were not statistically significant.

The relationship of growth in reading and spelling under two organizational plans

Once the investigator had obtained some evidence as to the similarity or dissimilarity of rates of growth in spelling when compared with rates of growth in reading, the primary purpose of determining the relationship of achievement gains in the two areas under two organizational plans. To achieve this purpose, "r" was computed for spelling and reading scores from tests administered in May to both groups under study. Table 10 presents the coefficient of correlation for reading and spelling scores made by pupils who had been taught under two different plans of organization for instruction.

The data shown in Table 10 indicate that the correlation between achievement in reading and achievement in spelling was significant only where the pupils were taught by an instructional team.

The relationship of achievement in the two areas was established, although the strength of the relationship was a low moderate one. The investigator recognizes the fact that the "r" is sensitive to the normality of the distribution of scores used in its computation. As shown on page 45, Table 9, the scores used for this computation departed somewhat from the normal distribution.

TABLE 10

COEFFICIENT OF CORRELATION FOR READING AND SPELLING SCORES ACHIEVED UNDER TWO PLANS OF ORGANIZATION

Organizational Plan	"r"
Self-Contained May, 1966	.18
Team-Teaching May, 1967	.44*

* Significant at the .05 level of confidence

The relationship of growth in reading and spelling achievement under two organizational plan

Pertinent to this study was the determination of the relationship between growth in reading and growth in spelling; whether or not spelling achievement increased as reading achievement increased where the pupils had been instructed under two plans of organization for instruction. In determining the existence of any relationship between

achievement in the two areas of study, "r" was computed using end of the year test scores for both groups. Data concerning the measures of central tendency and dispersion were presented at the beginning of this sub-section. Certain limitations were noted in terms of the distribution of scores as this distribution relates to the reliability of the resultant "r". The coefficients of correlation for reading and spelling are presented in Table 11.

TABLE 11

COEFFICIENTS OF CORRELATION FOR READING AND SPELLING ACHIEVEMENT UNDER TWO PLANS OF ORGANIZATION

Type of Organization	"r"
Self-Contained May, 1966	.18
Team-Teaching May, 1967	.44*

* Significant at the .05 level of confidence

The data shown in Table 11 indicates an existing relationship between achievement in reading and spelling where pupils had been taught by an instructional team. The correlation of scores in reading and spelling was not a significant one where pupils had been instructed in a self-contained classroom. Under the instructional team, there was a definite tendency for scores in reading and spelling

to increase in the same direction, one with the other.

Achievement in Reading and Arithmetic Reasoning of Pupils Taught in Self-Contained and Team-Teaching Instructional Settings

Arithmetic reasoning has reference to the ability to read, with comprehension, problem situations wherein pupils must discover solutions through the application of arithmetic processes. Since arithmetic reasoning situations are more often presented in written form than not, it is expected that pupils who achieve well in this content area will achieve well in reading. The relationship between the two sets of skills is expected to be a strong one. The level of achievement in either area may depend, to an extent, upon the emphasis upon the development of computational skill or the development of meaning and understanding during instruction in arithmetic. One reason for attempting to determine the relative achievement in reading and in arithmetic reasoning as taught under two plans of organization is to gather some information on the probable emphases focused upon in each case. The data collected from the reading and arithmetic reasoning components of the Metropolitan Achievement Battery are to be presented in this section of the report. In order to establish the existence of any relationship, "r" was computed for reading and arithmetic scores from tests administered to the pupils in May. Measures of central tendency and dispersion pertinent to these computations are presented in Table 12.

Table 12 shows arithmetic problem solving scores for pupils taught under a self-contained classroom plan.

TABLE 12

MEASURES OF CENTRAL TENDENCY AND VARIATION OF READING AND ARITHMETIC REASONING SCORES

	Number	Range Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Percent of Scores Below Mean Interval	Percent of Scores Above Mean Interval
Reading, Self-Contained Group	100	3.3-4.6	4.10	2.59	.261	20	41
Arithmetic, Self-Contained Group	100	3.2-5.1	4.12	4.09	.412	22	50
Reading, Team-Instruction Group	100	4.7-6.4	5.60	8.00	.805	34	46
Arithmetic, Self-Contained Group	100	4.2-6.3	5.24	7.33	.737	44	37

The scores on the arithmetic component of the Metropolitan Test ranged from a low grade equivalent of 3.2, to a high of 5.1, with a mean of 4.12, a standard deviation of 4.099, and a standard error of the mean of .412. Twenty-two or 22% of the pupils scored below the mean interval while 50 or 50% of the pupils scored above the mean interval. The data concerning the reading scores have been discussed as they have appeared in prior tables. In May, 1967, the pupils who had been taught by an instructional team scored an arithmetic problem solving tests within a grade equivalent range of from 4.2 to 6.3. The mean performance was 5.24 with a standard deviation of 7.33, and a standard error of .737. Forty-four or 44% of the pupils scored below the mean and 37 or 37% scored above the mean interval. Again the data concerning the reading performances at the same testing periods is as has been presented along with language and spelling data for May, 1966 and 1967. Through observation, however, it may be noted that for both groups, the distribution of reading and arithmetic scores follow similar patterns.

Achievement gains in arithmetic reasoning of pupils taught in a self-contained classroom

The data resulting from an administration of the arithmetic problem solving section of the Metropolitan Achievement Test to pupils who were taught in a self-contained classroom are presented in Table 13.

In September, 1965, pupils who were taught in a self-contained classroom performed on the arithmetic reasoning component of the Metropolitan Battery at levels which ranged from a low of 3.0 to a high of 4.1.

TABLE 13

GROWTH IN ARITHMETIC REASONING ABILITIES OF PUPILS TAUGHT IN A SELF-CONTAINED CLASSROOM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1965	100	3.0-4.1	3.64	2.68	.269	.480	1.983
May, 1966	100	3.2-5.1	4.12	4.09	.242		

The mean performance was 3.64, representing a grade equivalent of approximately six months in third grade. The standard deviation was 2.68 with a standard error of .269. In May, near the end of the same school year, the pupils tested again on a comparable form of the test, performed at levels which ranged from 3.2 to 5.1 with a mean performance of 4.12, a standard deviation of 4.09, and a standard error of .242. The difference between the means was .48 which approximates a five month difference in achievement from the beginning of the school year until near the end of the same school year. The "t" of 1.983 obtained in testing the significance of the difference between these means was not significant.

Achievement gains in arithmetic reasoning of pupils taught by an instructional team

The data resulting from an administration of the arithmetic section of The Metropolitan Achievement Test to pupils who were taught by an instructional team at the end of the school year are presented in Table 14.

In September, 1966, pupils who were taught by an instructional team performed on the arithmetic reasoning component of the Metropolitan Battery at levels which ranged from a low of 3.2 to a high of 5.1. The mean performance was 4.23, representing a grade level of nine months in the fourth grade. The standard deviation was 4.93 with a standard error of .496. In May, 1967, performance levels ranged from a low of 4.2 to a high of 6.3. The mean performance was a grade equivalent of 5.24; the standard deviation was 7.3 with a standard error of .737.

TABLE 14

GROWTH IN ARITHMETIC REASONING ABILITIES OF PUPILS TAUGHT BY AN INSTRUCTIONAL TEAM

	Number	Range of Grade Scores	Mean Grade Score	Standard Deviation	Standard Error of the Mean	Difference Between the Means	"t"
September 1966	100	3.2-5.1	4.23	4.93	.496	1.057	.727
May, 1967	100	4.2-6.3	5.24	7.3	.737		

The difference between the mean performances in September and in May was 1.057 representing slightly more than a one school year increase in achievement during that period. The "t" obtained for these data was .727, but was not significant at the .05 level of confidence.

Statistically, the gains made by both groups during one school year were insignificant. However, through observation it may be noted that those pupils taught by an instructional team appeared to have achieved an increase in mean test performance of one year while the group when taught in a self-contained classroom increased the mean test performance level approximately five months for one year. Therefore, there is indicated for the pupils taught by an instructional team, an expected amount of increase in achievement over one year. The group taught in the self-contained classroom achieved approximately one-half the increase as would be expected over an entire school year.

The relationship of growth in reading and arithmetic reasoning under two organizational plans

The investigator proposed in this study to determine the relative achievement or growth in reading and arithmetic problem solving and concepts. The question was asked, whether when there was an increase in one area under a different plan of organization, there was a corresponding increase in achievement under the other plan. As aforementioned, in order to determine the existence of any relationship, "r" was computed using test scores as indices of achievement in each area. The coefficients of correlation for reading and arithmetic reasoning test scores are presented in Table 15.

TABLE 15

COEFFICIENTS OF CORRELATION FOR READING AND ARITHMETIC PROBLEM SOLVING AND CONCEPT ACHIEVEMENT UNDER TWO PLANS OF ORGANIZATION

Type of Organization	"r"
Self-Contained May, 1966	.23*
Team-Teaching May, 1967	-.001

*Significant at the .05 level of confidence

Table 15 shows a low, but significant relationship between reading achievement scores and arithmetic problem solving and concepts achievement scores. Such a finding may indicate a closer integration of the instruction in the two areas in one plan than in the other. The finding further suggests that if there is the arrangement among a team of teachers for each teacher to function in an area of expertise, then as a "content" teacher, there may be a failure to consider instruction in those reading skills which are relevant to arithmetic problem-solving, especially when such problem-solving tasks are presented to the learner in written form. The results of the computation of "r" presented in this section may be interpreted in terms of relative growth in the two areas under consideration. The data appears to mean that under the self-contained plan of organization, when there is growth

in reading achievement, there is growth in arithmetic problem solving to a slight extent. In fact, the weakness of the relationship suggests a tendency rather than a trend in this regard. Under the team-teaching plan of organization, there seems to exist no such relationship.

Summary

In general this chapter has shown how a selected group of pupils has progressed under different plans of organization for instruction. Data reported have reflected levels of achievement and amounts of growth of pupils where there has been a self-contained, one teacher organizational setting and where there has been an instructional team to plan and implement instruction for these elementary school children.

An overview of levels of achievement show that the subjects were, for the most part underachievers in reading, spelling, language, and arithmetic reasoning. However, when considering rates of growth, it was shown that although there was some growth in achievement under each plan, there was a faster rate of growth for the same length of instructional time for the group taught by the instructional team. In this regard, it is important to remember that the qualifications and experience of the instructional team were superior to those of the teachers operating in the one-teacher, self-contained settings. An additional factor which could have contaminated the results of the investigation so that team-teaching resulted in greater achievement gains was related to the Hawthorne effect or to the newness of team teaching for both children and teachers involved.

When the data were analyzed in terms of the relationships which

existed between achievement in reading and each of three different study areas, there was one situation wherein the relationship was stronger as a result of the use of a one-teacher, self-contained plan. Such was the case with the reading-arithmetic problem solving relationship. For the reading-language and reading-spelling relationships, significant, but low and moderately low correlations were found.

It was revealing to note, in summary, differences in amount of achievement increase between groups taught under the two organizational plans. Table 16 summarizes these data, allowing the reader to view a total picture of the performance differences among the learners.

The intent of Table 16 is not that of determining significant differences between the mean achievement gains for both groups in four study areas. Rather the purpose of this summary table is to illustrate the fact that in the self-contained setting, the one-hundred pupils showed only an approximate five months increase in tested levels of achievement in reading, language, spelling and arithmetic. The .489, .521, .505, and .480 represent grade equivalent gains in months; for example, .489 roughly approximates five months gain since .489 is so close to .50. On the other hand, the achievement gains noted for the pupils taught by the instructional team show grade equivalents nearer to one year since 1.26 may be interpreted as meaning one year and two months. It is apparent that .938, .966 are near 1.0 or one year increase. The third column indicates the difference in the amount of gain achieved under the two plans for instruction. All of these differences favor the team-teaching plan of organization. This group was generally able to accomplish one year's growth in one school year.

TABLE 16

MEAN ACHIEVEMENT GAINS IN READING AND THREE STUDY AREAS MADE BY PUPILS TAUGHT UNDER DIFFERENT PLANS OF ORGANIZATION FOR INSTRUCTION

Study Area	Grade Equivalents Self-Contained Plan	Grade Equivalents Team-Teaching Plan	Difference Between the Means
Reading	.489	1.26	.771
Language	.521	.938	.417
Spelling	.505	.966	.461
Arithmetic	.480	1.009	.529

Statistically, the mean differences in growth were not significant. Comparative data are presented in Table 17.

None of the "t" scores were significant at the .05 level of confidence with 98 degrees of freedom. Table 17 shows the mean achievement scores for the May tests, thus summarizing the more specific information given in the body of the chapter. Further, differences were computed, the standard error of the difference was determined, and "t" computed for each study area, but the differences were not statistically meaningful.

Finally, coefficients of correlation were computed using scores resulting from the tests given in May. A summary table showing the results of the computations is presented in Table 18. In essence, Table 18 forms the bases for conclusions to be drawn from this investigation pursuant to the purposes set forth. It is shown that the relationships between achievement reading and achievement in three different selected study areas do differ, and are significantly different, when different organizational arrangements are used.

Under the self-contained classroom plan, as the pupils increased in achievement in reading, there was a tendency for their scores to increase in arithmetic. Under the team-teaching plan, no relationship of significance existed between performances in reading and performances in reading.

There were two significant relationships apparent where children were taught by an instructional team. The correlation between reading and spelling scores yielded a moderate, positive "r". This finding suggests that with the population studied, as reading achievement increased the spelling scores tended upward.

TABLE 17

STATISTICAL SIGNIFICANCE OF MEAN DIFFERENCES IN ACHIEVEMENT IN READING AND THREE STUDY AREAS OF PUPILS TAUGHT UNDER DIFFERENT PLANS OF ORGANIZATION FOR INSTRUCTION

Study Area	Mean Achievement Self-Contained Plan	Mean Achievement Team-Teaching Plan	Difference Between the Means	Standard Error of the Mean	"t"
Reading	4.103	5.600	1.497	.846	1.769
Language	4.176	5.220	1.044	.994	1.050
Spelling	4.106	5.138	1.032	.784	1.316
Arithmetic	4.121	5.244	1.123	.844	1.330

TABLE 18

SUMMARY OF CORRELATION COEFFICIENTS COMPUTED FOR SCORES IN READING WITH EACH OF THREE STUDY AREAS FOR PUPILS TAUGHT UNDER DIFFERENT ORGANIZATIONAL PLANS

Organizational Plan	Reading-Language "r"	Reading-Spelling "r"	Reading-Arithmetic "r"
Self-Contained	.14	.18	.23*
Team-Teaching	-.32*	.44*	-.001

* Significant at the .05 level of confidence

On the other hand, the computed "r" between reading and language was significant, but it was a negative, low coefficient. Such an "r" indicates that as the set of scores tended upward, the other set of scores tended to drop. Certainly a finding such as this must be questioned because reading and language in the elementary school are of the same skills-complex thought of as Language Arts. However, one might conjecture that with an instructional team, a desirable integration of the language arts may not have been the case. Various facets of the language arts-complex may have been delegated to different personnel and/or isolated from each other. Similarly, the negative correlation may have been a result of the emphasis placed on one or the other of the skills in the reading or language instruction which did take place.

From these data, it seems apparent that there may be advantages and disadvantages which must be considered when changes in organization for instruction are imminent, and that such changes ought to be made following an assessment of the effectiveness of one plan over another in terms of the objectives which have been formulated to guide the instructional program.

CHAPTER III

SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Rationale

Our nation faces certain serious problems which relate to the expansion of population, to technological advances, to the discovery of new forms of energy, to an extension of knowledge, to the rise of new nations and to a world-wide rivalry of ideologies.

The practical question is: Are the schools ready for the job? There are considerable reasons to say that they are not. The American school methods and facilities have evolved from what society considered best at a given moment. They have been molded by other cultures, customs, regulations, religious belief, and even by law. Today, acceptable ideas of school scheduling, size of classes, teacher load and responsibilities, instructional methods, and architecture have become hardened. These practices have not been changed basically for generations and their inflexibility makes it difficult to alter them now.

Improvement in American education has been refinement; each improvement has had its effect, but all have been limited by the existing framework of the schools.

A second reason for doubt arises from a limited interpretation

of the concepts of universal education. We have given it a single flat dimension that every boy and girl has an equal right to spend a certain number of years under a school roof.

That concept today is in need of re-examination. There are at least two other dimensions in the idea of universal education: (1) The maximum attainment of each student's talents, no matter how unequal that maximum may be, (2) the development of each student to go alone, and to understand education as a process that continues long after school years.

Changes are especially urgent because schools must provide education for increased numbers or persons, for longer spans of productive life, and at higher levels of understanding, competence, and skills to strengthen our way of life.

The task calls for a re-examination of school organization, functions, and methods of operations.

The writer's interest in ways of organizing for instruction grew out of study and discussion conducted as a part of a course in curriculum planning wherein special attention was given to some of the more recent changes and innovations in various facets of school organization. During this same period, the writer had first-hand knowledge of the construction of a new elementary school which had been specifically designed for a team teaching pattern of organization. Naturally there was concern for the advantages and/or disadvantages of team teaching in terms of the pupil population with which the investigator was familiar.

Through this investigation, it is hoped that this study will

focus attention on the need for continuous evaluation and revision of innovations in education, especially as they relate to specific pupil populations.

Problem and Purposes of the Study

The problem for which this study was designed was to investigate the question of whether tested achievement in language, spelling, and arithmetic reasoning correlate more closely with achievement in reading when teaching is done in a self-contained classroom than when instruction proceeds under a team teaching pattern of classroom organization.

The main purpose of the study was to determine the existence of any significant relationships which skill in reading may have to other content areas when pupils are organized for learning activities under a one-teacher, self-contained classroom plan, on the one hand, and a team teaching plan on the other. More specifically, the following questions were asked:

1. Are the relationships between achievement scores in reading and language significant ones, both when pupils are taught in a self-contained classroom and when they are taught by an instructional team?

2. Are the relationships between achievement scores in reading and spelling significant ones, both when pupils are taught in a self-contained classroom and when they are taught by an instructional team?

3. Are the relationships between achievement scores in reading and arithmetic problem solving significant ones, both, when pupils are taught in a self-contained classroom and when they are taught by an instructional team?

Research Design and Procedures

This investigation employed a descriptive-survey method of re-

search. Test scores from comparable forms of the Metropolitan Achievement Battery comprised the basic data for the survey. A statistical treatment of the data included measures of central tendency, measures of variability and the Pearson's Product-moment coefficient of correlation. The test of significance of coefficients of correlation was determined through the use of statistical tables listing coefficients of correlations significant at the .05 and .01 levels of confidence at varying degrees of freedom, adapted from Wallace and Snedecor.[1] Differences in significant correlations were determined by noting differences of verbal descriptions of such correlations as negligible, low, moderate, high or very high.

One-hundred test scores were randomly selected from the scores of all fourth grade scores from the Metropolitan Achievement Battery administered in the fall and spring of the 1965-66 school year. These were the scores of children who had been taught in the self-contained organizational setting. During the following year, 1966-67, these same children were taught in a team teaching organizational setting. The achievement scores from comparable forms of the Metropolitan Achievement Battery were recorded for the same one-hundred children for the 1966-67 school term. The mean scores for the group were computed for performances in reading language, spelling, and arithmetic problem solving for fall and spring testings for the 1965-66 term and for the 1966-67 term. The correlation coefficient "r" was computed

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[1] J. P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Co., Inc., 1965), pp. 580-581.

using reading and language scores, then reading and spelling scores, and finally reading and arithmetic scores for both years under consideration. The significance of these correlation coefficients was determined through the use of statistical tables.

The one-hundred subjects whose scores were used in this research were both male and female ranging in ages from ten through twelve. The subjects came from lower middle class homes consisting of parents of unskilled and semi-skilled labors. The pupils were grouped in order to provide individually planned programs for learners, taking into account the specific objectives to be achieved, promoting flexibility in assigning pupils for instructional grouping. The school provided an opportunity for each student to progress according to his ability.

The teachers in the self-contained classrooms consisted of four female teachers each of which held A.B. Degrees from Atlanta colleges. The four teachers had a total of thirty-seven years in teaching experience.

The teachers in the team teaching organization consisted of one male and four female teachers, of which four held A.B. Degrees from Atlanta colleges and one held a M.A. Degree from Atlanta University. The total teaching experience for the five teachers was fifty-one years.

Summary of Related Literature

Literature pertinent to this study was reviewed in terms of the following area of concern:

1. The use of team teaching in elementary and secondary schools.

2. Large-group instruction.

3. The self-contained classroom.

The use of team teaching in elementary and secondary schools

Many curriculum problems, particular those in which the building of a unified educational program are effected, are best attacked by a team combination of backgrounds and skills. Some training is often needed to ensure efficient operation as a team but the results will repay the extra effort.[1]

Today Americans are trying to respond creatively to changing needs and circumstances. One of the newest stars on the educational horizon has been the revised team teaching concept. Since 1957 America has witnessed a kind of "team teaching" explosion. Hundreds of schools have been experimenting with variations of team teaching, but regardless of the variation, it is still essentially a way of organizing the staff, the instructional program, the school area, and school equipment.

Team teaching is more of an organizational idea than a set of procedures and practices. Teams differ in many ways and no two teams are likely to work in the same way. It is this flexibility which lends itself to the school's needs.

In general, certain basic elements are present in team teaching programs. Teams are composed of a given group of four to six teachers,

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[1]Harold J. McNally, Improving the Quality of Public School Programs (New York: Columbia University, 1960), p. 49.

100 to 150 students, and resources both within the school (interns, teachers aids, counselors, librarian, etc.) and outside it.

The team usually instructs of students from one grade level. This is a faculty team which assumes responsibility for a substantial portion of the academic program for the group. Each team usually has a leader, a faculty member who coordinates the team's efforts. The clerical and routine duties are performed by noncertified teacher's aids, thus freeing the teachers of the team for planning, organizing, evaluating, and counseling. Each team may develop a roster of citizens or community resources upon which to draw in order to enrich the program.

The self-contained classroom

In the self-contained classroom, the school day is composed of as many different periods as there are different subjects, usually without too much regard for whether each succeeding subject in the day is related to its predecessor or its successor. In the elementary school this means that the teacher usually remains with the same group throughout the day. However, a number of school systems over the years experimented with many kinds of self-contained classrooms.

In more recent years the public has demanded modifications of the old self-contained classroom methods. Out of this, came the specialists in particular areas of study, such as, physical education, music, and art. The specialists usually spent part time at a given school, but traveled to several schools to teach full time. From the specialists programs came the team teaching idea.

Large group instruction

Any class that contains more than 15 students provides a large group. Basically, large-group instruction is teacher-dominated. Although the learner is physically passive except for taking notes, he is very active mentally as he reacts to what he sees and hears, and as he notes the matter he wishes to discuss further with his colleagues or to study in an appropriate setting.

Just how effective large-group instruction is depends on the two factors of preparation and presentation.

It has been proven by many public school systems that pupils learn faster where through adequate planning, organization, scheduling, school and community participation, teachers and teachers aids work together as a team. The teacher will receive more professional and personal stimulation working on a team than working in isolation. There will be better communication among staff members, more motivation for better cooperative planning, and continuous curriculum improvement.

Communication within teams and between teams has yet to be perfected, but the instructional responsibilities of the members of a team vary in accordance with staff function, professional specialization, competence, and personal interest and desire.

The challenges on the nuclear age place the emphasis on change, and with this change will come the instructional revolution. We need this if it will help us to make more efficient use of teachers' time and skills.

Team teaching promises to ease the teachers' shortage, given superior teachers an opportunity to assume superior responsibilities,

improve salaries for teachers, free teachers from burdensome duties, and provide better educational opportunities for our children.

Findings

The findings presented below resulted from the investigation into existing relationships between reading and three different study areas when pupils were taught under a self-contained plan of organization and when pupils were taught by an instructional team.

Findings concerning the reading achievement of one-hundred pupils under two plans of organization were:

1. For pupils taught in a self-contained classroom, the difference between mean reading performances at the beginning and end of a school year was .489, representing a grade equivalent gain of approximately five months.

2. For pupils taught by an instructional team, the difference between mean reading performances at the beginning and end of a school year was 1.26, representing a grade equivalent gain of one year and two months.

3. For pupils taught in a self-contained classroom, the difference between mean language performances at the beginning and end of the school year under study was .521, representing a grade equivalent gain of five months.

4. For pupils taught by an instructional team, the difference between mean language performances at the beginning and end of the school year under study was .938, representing a grade equivalent gain of approximately nine months.

5. The coefficient of correlation for reading and language scores, where pupils were taught in a self-contained classroom was .14. This was not a significant correlation coefficient.

6. The coefficient of correlation for reading and language scores, where pupils were taught by an instructional team was -.32. This correlation coefficient was significant at the .05 level of confidence.

7. For pupils taught in a self-contained classroom, the difference between mean spelling performances at the

beginning and end of the school year under study was .505, representing a grade equivalent gain of five months.

8. For pupils taught by an instructional team, the difference between mean spelling performances at the beginning and end of the school year under study was .966, representing a grade equivalent gain of more than nine months, approximately one school year.

9. The coefficient of correlation for reading and spelling scores, where pupils were taught in a self-contained classroom was .18. This was not a significant correlation coefficient.

10. The coefficient of correlation for reading and spelling scores, where pupils were taught by an instructional team was .44. This correlation coefficient was significant at the .05 level of confidence.

11. For pupils taught in a self-contained classroom, the difference between mean arithmetic reasoning scores at the beginning and end of the school year under study was .480, representing a grade equivalent gain of approximately five months.

12. For pupils taught by an instructional team, the difference between mean arithmetic reasoning scores at the beginning and end of the school year under study was 1.05, representing a grade equivalent gain of one year.

13. The coefficient of correlation for reading and arithmetic reasoning scores, where pupils were taught in a self-contained classroom was .23. This correlation coefficient was significant at the .05 level of confidence.

14. The coefficient of correlation for reading and arithmetic reasoning scores, where pupils were taught by an instructional team was -.001. This correlation coefficient was not a significant one.

Conclusions

Findings resulting from this study supported the following conclusions:

1. For the same amount of instructional time, one school year, the reading achievement levels of pupils taught by an instructional team increased more rapidly than the reading achievement levels of pupils taught in a self-contained

classroom. This difference in achievement levels was not statistically significant, but was considered a favorable trend.

2. For the same amount of instructional time, one school year, the language achievement levels of pupils taught by an instructional team increased more rapidly than the language achievement levels of pupils taught in a self-contained classroom. This difference in achievement levels was not statistically significant, but was considered a favorable trend.

3. The strength of the relationship between reading and language scores was not only significant, where pupils had been taught by an instructional team, but the relationship was closer than for pupils who had been taught in a self-contained classroom.

4. For the same amount of instructional time, one school year, the spelling achievement levels of pupils taught by an instructional team increased more rapidly than the spelling achievement levels of pupils taught in a self-contained classroom. This difference in achievement levels was not statistically significant, but was considered a favorable trend.

5. A relationship between reading and spelling scores, insofar as both sets of scores tended to increase, one with the other, did not exist for pupils taught in either setting. Although the relationship between spelling and reading scores was significant for pupils taught by an instructional team, it was a negative one, indicating divergent tendencies in the sets of scores.

6. For the same amount of instructional time, one school year, the arithmetic reasoning achievement levels of pupils taught by an instructional team increased more rapidly than the arithmetic reasoning achievement levels of pupils taught in a self-contained classroom. This difference in achievement levels was not statistically significant, but was considered a favorable trend.

7. The relationship between reading and arithmetic reasoning scores was a closer one where pupils had been taught in a self-contained classroom.

Implications

The following implications were drawn from findings and conclusions resulting from this investigation:

1. There may be some advantages in using team teaching plans of organization for promoting numerically faster rates of growth for a given period of instruction.

2. Whether or not there is achieved a closer integration of learnings under one or the other types of organization depends more upon specific objectives implemented by the instructional personnel than upon the plan of organization itself.

Recommendations

On the basis of the findings, conclusions, and implications set forth as a result of this investigation, the following recommendations are made:

1. That when school administrative personnel deem it necessary to adopt different, and perhaps innovative plans of organization in the elementary school, that they do so, but not without formulating specific instructional purposes to be implemented within the framework of that organizational plan.

2. That instructional personnel engage in more deliberate planning in order to insure a closer integration of reading skills and learning in content areas.

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